

REMARKS

Favorable reconsideration and allowance of this application are requested.

With respect to the requirement that the sole accompanying drawing Figure be labeled as Figure 1, applicants note that the Guide for the Preparation of Patent Drawings (copy attached) indicates that neither a Figure number nor the abbreviation Fig. should appear. Accordingly, withdrawal of such a requirement is requested.

By way of the amendment instructions above, the specification and many of the originally presented claims have been revised in an effort to address the Examiner's objections raised thereagainst. Thus, it is believed that the all specification and claim objections/rejections advanced in paragraphs 5-11 have been overcome.

Claim 1 has been revised so as to emphasize that the gel polymer is the reaction product of (A) a **heterocyclic** amine-group containing material, and (B) a halide-group or epoxy-group containing material. A similar revision appears in independent claim 18, but is stated to be commensurate with the gellable electrolyte defined thereby.

Claim 2 has been cancelled and claims 62-64 have been added. On this regard, independent claim 62 defines the heterocyclic amine-group containing material to be a "vinylpyridene", while claim 63 dependent thereon requires that the vinylpyridine compound (A) is poly(2-vinylpyridine-co-styrene), and the epoxy-group containing material is butanediol diglycidyl ether. Claim 64 defines a rechargeable battery comprising an anode, a cathode, a microporous separator separating said anode and said cathode, and a gel polymer electrolyte according to claim 62 or 63. Thus, each of claims 62-64 read on the elected invention and species and are properly examined along with the previously elected claims.

The only issues remaining to be resolved in this application are the Examiner's art-based rejections. Specifically, claims 1, 2, 4-10, 14-18, 20-26 and 30-36 attracted a

rejection under 35 USC §102(b) as allegedly anticipated by the Andrieu et al paper, while claims 1, 2, 4-10, 14-18, 20-26 and 30-34 attracted a rejection under 35 USC § 102(b) based on the Andrieu et al patent (USP 5,202,009). Claims 1-2, 4-10, 14-18, 20-26 and 30-36 also were rejected under 35 USC §102(b) as allegedly anticipated by Abrizzani et al. Applicants suggest that none of the applied publications is appropriate as a reference to reject the amended and new claims now pending herein.

As the Examiner recognizes, epoxy compounds have notoriously been well known as a crosslinking agent and used to cure polymer chains over the last several decades (Please see in this regard, the attached copy of US Patent No. 4,383,103.) The most important technical detail in the field of polymer electrolytes, however, is to find the correct polymer structure for battery applications. Such a task is quite difficult since the polymer should have high voltage stability as well as high ionic conductivities. As such, this filed of endeavor is highly unpredictable.

All of the applied publication references forming the bases of the Examiner's rejections disclose crosslinked **polyalkylene oxides**. Polyalkylene oxides are well known polymers that those in this art have worked with for over 30 years as an electrolyte for rechargeable lithium batteries.

However, in direct contrast, the present applicants have discovered a novel gel polymer electrolyte for rechargeable batteries which is comprised of a liquid electrolyte and a gel polymer which is the reaction product of (A) a **heterocyclic amine-group containing material**, and (B) a halide-group or epoxy-group containing material. Most preferably, the heterocyclic amine-group containing material is a **vinylpyridine** which may be cross-linked via the a halide-group or epoxy-group containing material to form the gel polymer.

None of the applied references discloses or even remotely suggests such a novel gel polymer electrolyte as defined in applicants' pending claims herein. As such, the

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presently pending claims are both novel and unobvious over all applied references of record. Withdrawal of such references and early passage of this application to issue are therefore solicited.

Finally, an express disclaimer of the parent application Serial No. 09/760,720, is being filed concurrently herewith. As such, the "double patenting" issues raised in paragraphs 16-19 of the subject Official Action have been mooted.

Respectfully submitted,

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